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# Money Management / Risk

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# Scope of Presentation

- Money Management/Capital Preservation
- Simple Methods – Short to Intermediate-term trading
- Rational methods (quantitative) of
  - Stop selection
  - Position Sizing

# Money Management Revolves Around Knowing:

- How much you are willing to risk in any one trade and
- How to appropriately construct your investments to meet that objective

# Preserve Capital by Minimizing Size of Each Loss

- IBD approach mandates limiting losses to 7-8% for any position
  - Drawdown effect
  - 3 to 1 Profit-Loss Ratio

# Effect of Draw Down

<b>% LOSS</b>	<b>% Gain to Breakeven</b>		<b>%LOSS</b>	<b>% Gain to Breakeven</b>
10%	11%		60%	150%
20%	25%		70%	233%
30%	43%		80%	400%
40%	67%		90%	900%
50%	100%		100%	Broke

# Investor can be right on only 30% of stock trades (and wrong 70%) and still be profitable

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## EXAMPLE

Capital

Profit/(Loss)

**Trade 1** - Buy 100 shares X @ \$50  
Stops out @ -7%

\$5000

(\$350)

**Trade 2** - Buy 100 shares Y @  
\$46.50 Stops out @ -7%

\$4650

(\$326)

**Trade 3** - Buy 100 shares of Z @  
\$43.24 Z sold for \$51.83 (20%  
gain)

\$4323

\$860

Net Gain from 3 Trades

\$5183

\$183



# Sell Stop Orders

- Employing sell stop orders helps manage losses and can be adjusted to help lock in gains. However, sell stop orders are not guaranteed to get the price you want. Gaps between closes, illiquidity (low volume) and quick changes in volatility can impact where, and if, orders are executed.
- That said, sell stop orders are necessary to manage risk and apply proper position sizing. Even though there is no perfect sell stop order system, properly placed sell stops help more than they hurt. Always use a sell stop order.

# Placing and Initial Sell Stop Order

- Sell stops need to be placed at realistic levels and should consider support and resistance, time horizon and trading style and risk tolerance. Some strategies depend upon placing a stop that waits for the market to trade up by some amount before starting to trail.
- Trend lines, moving averages, and previous highs and lows are reference points for setting and adjusting stops



# Guideline for Sell Stops

The following are simple guidelines for setting sell stops based on *technical (or pattern) analysis* based on levels of support or resistance for swing or momentum trading:

- Bullish trades: 3 percent below **support** for intermediate trend trades, closer to 1 percent on shorter term swing bounce or breakout momentum trades
- Bearish trades: 3 percent above **resistance** for intermediate trend trades, closer to 1 percent on shorter term swing bounce or breakout momentum trades

# Sell Stops (cont'd)

Sell stops can also be adjusted based on the amount of *risk*:

- If the stock price gains to a point that equals the amount of the initial risk, move the sell stop to the breakeven price.
- When the stock gains EQUAL the amount of the initial risk, sell part of the position

# Adjusting Stops

- Sell stops should be adjusted when forming a new level of support or resistance.
- New highs and lows, or changing values on trend lines and moving averages, can be used to adjust sell stops.
- The purpose of these adjustments is to help lock in gains when the price reverses:
  - Bullish trend investors normally adjust sell stops based on the recent low, current trend line or moving average.
  - Bullish swing investors adjust sell stops based on a recent high to capture most of the swing.

# Adjusting Stops (cont'd)

- Never move a stop backwards from its initial price — **stops should always be moved to reduce, never increase, the amount of risk** on a trade.
- If you have a broker that charges to place stops – find a new broker
- Most of the major trading tools like TOS and Schwab have ways to place combined entry and exit orders automatically.

# Bracket Trade (StreetSmart Pro)

- Bracket orders are conditional orders you can attach to your stock or option orders. They consist of a primary order and up to three contingent orders, which if triggered, will close out the position opened by the primary order. The trader can specify three types of exits:
  1. Profit Exit
  2. Trailing Stop Exit
  3. Stop Loss Exit



# Position Sizing

Dr. Van K. Tharp did an experiment which shows the importance position sizing. In his 2006 book "Trade Your Way to Financial Freedom" Van gives the results of his testing of four different position sizing models. He tested the models on the same trading system, so the only variable was the position sizing. The simulations were run with an initial equity of \$1,000,000 and took 595 trades over a 5.5 year period. The models produced drastically different results:

# Position Sizing Models

1. The worst was the baseline model which just bought 100 shares of stock whenever a signal was given. That model returned **\$32,567** or 0.58% annualized.
2. Fixed-amount model: This method traded 100 shares per \$100,000 in equity. It returned **\$237,457** or 5.75% annualized.
3. Equal leverage model: Each position in this model was 3% of the account equity. So at the start of the trial each position was \$30,000. This method returned **\$231,121**.

# Position Sizing Model (cont'd)

4. Percent risk model: According to this model positions were sized such that the initial risk exposure was 1% of the account equity. So with \$1,000,000 equity the initial risk would be \$10,000. So if the initial stop on a trade was \$1 the system would trade 10,000 shares. For an initial stop of 50 cents the system would trade 20,000 shares, etc. This model returned **\$1,840,493** or 20.92% annualized.

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# Position Size Model (cont'd)

5. Percent Volatility model: Positions were sized based on each stock's volatility — the more volatile the stock the fewer shares are traded. For this trial positions were pegged at 0.5% volatility (initially \$5,000 per position) — so if a stock's average true range (ATR) was \$5 the system would trade 1,000 shares. This model returned **\$2,109,266** or 22.93% annualized.

# Percent Risk Position Sizing

- Risk the same fraction (“fixed fraction”) of the account equity on each trade; e.g., 1-2%.
- Number of shares/contracts:

$$N = ff * \text{Equity} / |\text{Trade Risk}|$$

where  $ff$  = fixed fraction,  
Equity = account equity (\$),  
Trade Risk = possible loss on trade (\$)



# Percent Risk (Fixed Fraction) Model

- The rule of the Percent Risk Model is to never lose more than 1 - 2 % of your TOTAL ACCOUNT VALUE on any one trade. This does not mean that you should put only 1 - 2 % of your account into each trade. It means that you should buy only enough shares so that if the stock hits your stop order, you lose a maximum of 1- 2 % of your total account value. For example, with a \$100,000 account, you should never lose more than \$1,000 to \$2,000 on any one trade. When beginning, use a smaller percentage until you are consistently making money, then increases the percentage.

# Percent Risk Model (cont'd)

Four step procedure to determine the correct position size and keep your risk at no more than 2%.

## **1. Start with three numbers**

- a. Account value at the time you place the trade
- b. Price at which you will buy the stock (buy price)
- c. Lowest price at which you are willing to sell the stock (stop order price) – i.e. 7%-8% per IBD rules

## **2. Calculate your acceptable loss**

- a.  $\text{Total Account Value} \times \text{Risk Percentage} = \text{Acceptable Loss}$

# Percent Risk Model (cont'd)

## **3. Calculate your risk**

a.  $\text{Buy Price} - \text{Stop Order Price} = \text{Risk}$

## **4. Calculate the number of shares to buy**

a.  $\text{Acceptable Loss} \div \text{Risk} = \text{Position Size}$

Example:

An investor with a \$30,000 account wants to buy a stock at \$29 and set a stop order at \$26. The investor uses the following formula to decide how many shares to buy in order to keep the trade's risk at 2%.

# Percent Risk – Example 1

## **Step 1: Start with three numbers**

Account Value: \$30,000

Buy Price: \$29

Stop Order Price: \$26 (10% loss)

## **Step 2: Calculate your acceptable loss**

Account Value: \$30,000

Risk Percentage x 2 %

Acceptable loss: \$600

# Percent Risk Example 1 (cont'd)

## Step 3: Calculate your risk

Buy Price: \$29

Stop Order Price: \$26

Risk: \$3

## Step 4: Calculate the number of shares to buy

Acceptable Loss: \$600

Risk:  $\div$  \$3

= Position size: **200 Shares**



# Percent Risk Example 2

Apply the IBD rule for 7-8% max trade loss and the 2% Account Risk

## **Step 1: Start with three numbers**

Account Value: \$30,000

Buy Price: \$29

Stop Order Price: \$26.97 (7% loss)

## **Step 2: Calculate your acceptable loss**

Account Value: \$30,000

Risk Percentage x 2 %

Acceptable loss: \$600

# Percent Risk Example 2 (cont'd)

## Step 3: Calculate your risk

Buy Price: \$29

Stop Order Price: – \$26.97

Risk: \$2.03

## Step 4: Calculate the number of shares to buy

Acceptable Loss: \$600

Risk: ÷ \$2.03

= Position size: **295 Shares (round to 300 shares)**

# Finding the Best Fixed Fraction

- Ad hoc; e.g., 1-2% money management rule.
- “Optimal  $f$ ”: Ralph Vince, *Portfolio Management Formulas*, 1990.
- “Secure  $f$ ”: Leo Zamansky & David Stendahl, TASC, July, 1998.
- Monte Carlo simulation: Bryant, TASC, February, 2001.

# Percent Volatility Model

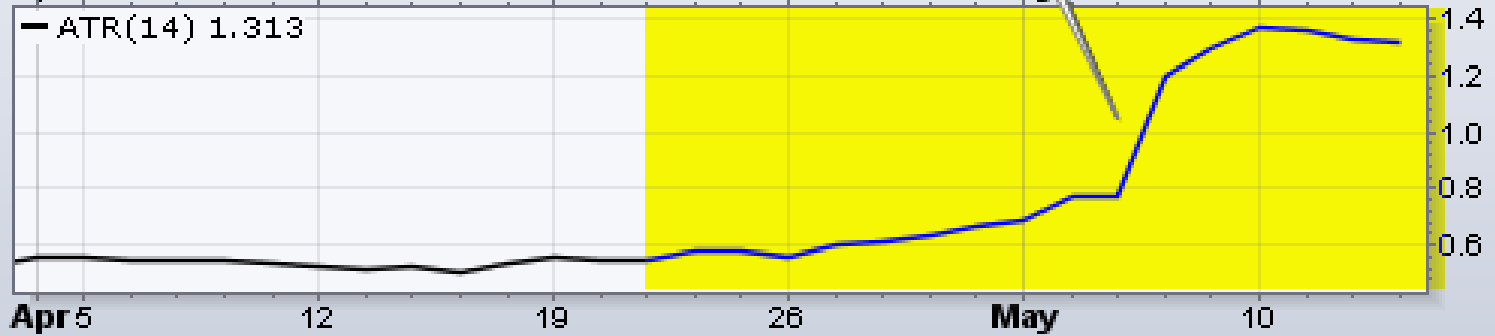
- This model for position sizing is based on the technical indicator known as “average true range” (ATR). The ATR is a number derived from a formula that enables you to compare the volatility of various stocks and other instruments. As the name implies the ATR indicates how many points a ticker move in an average day, including gaps.
- ATR is a technical analysis volatility indicator developed by J. Welles Wilder. The average true range is an N-day exponential moving average of the true range values.

QQQQ (PowerShares QQQ Trust) Nasdaq GM

© StockCharts.com

13-May-2010 4:00pm O 48.43 H 48.79 L 47.73 Last 47.85 V 102.8M Chg -0.77 (-1.58%) ▼

W QQQQ (Daily) 47.85





# Average True Range (ATR)

- A couple of examples:

IBM (\$139/sh) was 1.681 and BIDU (\$105/sh) was 3.13 --- reflecting the volatility and the relative price.

- A simple application of ATR is to set the target stops 1 ATR (or 2 ATRs or 3 ATRs) from entry.
- Example - using 1 ATR:
  - IBM stop ( $\$139 - \$1.681 =$ ) \$137.31 or
  - SLV stop at ( $\$105 - \$3.13 =$ ) \$101.87

# Volatility Model using ATRs

- Another variation for setting the stop is the 50 day MA minus 2 ATRs
- Example:
  - IBM stop ( $\$131.4 - \$1.881 =$ )  $\$127.64$  or
  - BIDU stop at ( $\$20.57 - \$0.866 =$ )  $\$19.70$
- In general, short term traders can use a small period ATR and a low multiple (1 to 1.5). Longer-term trend following may use a multiple week period for the ATR and a multiple of 2 or greater to calculate stops. As the ATR increases, the suggested stop placement can get quite large.

# Volatility Model Using ATRs (cont'd)

- Also notice that the stops self-adjust to the market: They begin to narrow as the volatility (in this case, the average true range) begins to drop off. As you can see, even with a low multiple and short period average true range, the stops can get quite large during volatile markets.
- Dave Landry describes a strategy using the ATR (short-term):
  - Buys a full position at a low risk entry point after a pullback.
  - Sets a stop based on average true range that is usually larger than the IBD 7%-8% stop.

# Volatility Model Using ATR's (cont'd)

- Initial stops are usually approx. 15%, but his position size is small so that his portfolio loss would be 2% if the stop is hit.
- Takes 50% profits if the stock goes up by an amount equal to the amount of his stop. If a stock keeps trending, he then lets the 50% balance ride for a long, long time with stops that trail upward but are very loose.

# Volatility Model with Stock Price

- The concept can be expanded further by taking the ATR and the price of the stock to compute the profit potential of the stock relative to the investment (capital) required.
- Those stocks with a higher ratio are going to automatically make better use of buying power than those with a low ratio. (From Trading ETF's – by Deon Wagner)
- $\text{Stock Price (10 day MA)} \div 50 \text{ day ATR} = \text{Size Ratio}$
- Using the 10 day MA (rather than previous day closing) is to smooth out any anomalies from recent price action.



# Volatility w/ Stock Price (cont'd)

- The resulting number (size ratio), reflects how volatile the stock acts (lower numbers- more volatile)...usually this number is in the range of 30-100.
- If the size ratio is 50-75, the "normal" risk management guide can be applied. Once the size ratio drops below 50, a lower position size (75% of normal) but a larger stop should be considered to avoid be "stopped out" from the daily volatility. If the size ratio is greater than 75, then consider increasing the position 25% above "normal" and reducing the stop limit.

# Suggestions for Trailing Stops

Some ideas for trailing stops:

- Try basing the size of the stop on volatility, as suggested for money management stops, but use a smaller value.
- Try tightening the stop sharply after a big move in your favor (but not before).
- If the trailing stop is tighter than the money management stop, wait until the market has moved in your favor by some multiple of the ATR before applying the trailing stop.

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[illegible]

- IBD mandates max loss 7-8%
- Always use a sell-stop order (Simple sell stop rules)
  1. Set stops 3 percent below support for bullish trades
  2. Set stops 3 percent above resistance for bearish trades
  3. Adjust stops to reduce risk and lock in gains

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- Volatility-based stops have the advantage of reducing the chances of getting stopped out with the added cost of risk.
- Dollar-based stops have the disadvantage of frequently stopping you out of a position but at a lower risk per trade.
- With Pattern-based stocks incorporate technical analysis to help determine where initial stops should logically be placed. Because, to some extent, pattern-based stops incorporate market volatility, they can often be large.

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Never (RISK) lose more than 1 percent to 2 percent of your TOTAL ACCOUNT VALUE any one trade:

1. Calculate your acceptable loss:  
$$\text{Total Account Value} \times \text{Risk Percentage}$$
2. Calculate your risk: Buy Price – Stop Order Price
3. Calculate the number of shares to buy:  
$$\text{Acceptable Loss} / \text{Risk}$$

# References

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